

JUL 20 2006

U.S. Application No. 10/781,677

**REMARKS**

The Applicants request reconsideration of the rejection.

Claims 1-4 and 6-19 were examined. With this Reply, claims 3-4, 6-8, 10-16 and 18-19 are canceled, and new claims 20-22 added. Therefore, claims 1-2, 9, 17 and 20-22 remain pending.

In light of the cancellation of claims 6-8, the objection on page 2 of the Office Action is moot.

Claims 1-4, 6-8, 11-16 and 19 were rejected under 35 U.S.C. §102(e) as being anticipated by Maurer, III et al., U.S. Patent Publication No. 2003/0065780 (Maurer). The Applicants traverse as follows.

The present invention is directed to a data processing method and device in which a database process is performed in parallel with a predetermined process such as re-organization. In a non-limiting example, during conventional duplication of a database, when the original database requires a predetermined processing such as reorganization or fragmentation, the invention permits the duplication processing to continue while the reorganization or fragmentation is performed.

Turning to amended claim 1, the claimed data processing method comprises steps of generating a second database as a duplicate of a first database, thereafter switching a program access allowance from the first database to the second database, executing predetermined processing for the first database, and after completion of the predetermined processing, updating the first database. Of note is the step of storing a history of a processing of the program to the second database

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as a processing history, a processing history being stored during the execution of the predetermined processing for the first database. Then, upon completion of the updating of the first database according to the processing history stored, the method switches the program access allowance from the second database back to the first database.

Maurer describes a mirroring process performed on the contents of a first volume group to create contents in a second volume group. According to Maurer, when a fault occurs in access to the first volume group, the access is re-directed to the second volume group (the mirror of the first volume group). Once the first volume is restored, the access is directed back again to the first volume group. In particular, Maurer creates mirrored copies of data of the first volume group on a first computer system as the second volume group in a second computer system, and creates a map of logical information to physical devices on the first computer system so that a duplicate of the mirrored copies can be mounted on the second computer system by using the map to create a second volume group that is substantially identical to the first volume group.

According to Maurer, when a mirror is established, the data storage 119 creates a mirror image (copy or replication) of the source or standard volume. When using the preferred Symmetrix, such a mirror is denoted as a business continuance volume (BCV), also referred to in general terms as a mirrored disk. If data on the standard volume changes, the same changes are immediately applied to the mirrored disk. Then, when the mirror is "split", the mirrored version of the disk is

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isolated and no further changes are applied to the mirrored volume. After the split, the primary disk can continue to change but the mirror maintains the point-in-time data that existed at the time of the split.

Maurer further explains that mirrors can be synchronized such that changes from the standard volume that occurred after the split can be applied to the BCV or mirrored disk, thus bringing the mirrored disk current with the standard.

Synchronization can be performed in the other direction as well, to make the primary disk match the mirror.

However, Maurer's "changes" are not explained as to format, or as to how and where the change are stored or identified. Maurer simply discusses a general "synchronization" process after the mirror is split.

Indeed, it appears that the data position of the mirrored disk according to Maurer must be the same as that of the source disk. That is, each discussion of "mirroring" seems to indicate that the data and the data position must coincide with each other. This type of mirroring is well-known with the use of a bitmap in which a bit corresponding to an updated physical area is set, and the data of the specified updated physical area of the source disk is copied to the same physical area of the mirrored disk.

According to the present invention, on the other hand, after the current database (apparently corresponding to Maurer's first volume group) is switched, a predetermined processing (such as the exemplary reorganization) is performed on the first database, during the execution of storing the processing history to the

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second database. Such reorganization, for example, may change the position of the data and/or the structure of the database. For example, compression may be performed on the originating database to remove empty or deleted record areas, such that the record length of the database may be changed. In any event, after such predetermined processing, the first database may be different from the second database in either or both of physical structure and physical data position. Accordingly, the update information of the present invention specifies the data and the update contents logically, but not physically.

Turning to claim 1, the claim requires that after switching the program access allowance from the first database to the second database, a history of a processing of the program to the second database is stored as a processing history during execution of a predetermined processing for the database. Then, after completion of the predetermined processing of the first database. The first database is updated based on the processing history stored during the predetermined processing. The processing history is what permits the second database to have a different physical structure and/or physical data position from that of the first database. Therefore, the updating of the first database based on the processing history stored during the predetermined processing permits the newly-processed first database to regain its contents, as updated during the time of the predetermined processing, without requiring a mirroring of the contents that might negate the advantages of the predetermined processing.

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Concerning the processing history, the Applicants refer the Examiner to Fig. 10 of the present application, which shows an example of the update information. Note that in the Fig. 10 example, each record includes a table name and a key value which logically specify the database and the record of the database.

Maurer, on the other hand, describes a "redo log" in paragraphs [0107] – [0109]. The redo log itself is included in the database. The redo log represents differential data between the back-up database and the current database, from which data can be recovered in the event of a system failure. However, the redo log does not relate to the differential data between the source database and the mirrored database, and does not relate to the update information between a split disk and a current disk.

In further contrast, the update information file 109 described in the present specification is included in the disk system 105 and is independent of the main database 107 and the duplicate database 109. The update information is accumulated only when access to the main database is inhibited. Of course, before the main database is made current again, the update information is reflected back to the main database.

Accordingly, the present invention is different from Maurer in both the relationship between the first and second databases, and in the contents and characteristics of the update information reflected in the processing history of the claimed invention and in the redo log of Maurer.

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Independent claim 2 is directed to a data processing device comprising various means for performing functions similar to the steps of method claim 1, and is thus patentable on the basis of the arguments set forth above.

New claim 22 is an independent claim directed to the program that carries out processing corresponding to the method of claim 1 and thus is patentable as well.

New dependent claims 20 and 21 limit the predetermined processing to the reorganization of the first database, as discussed in general terms above. Accordingly, claims 20 and 21 represent separately patentable features of the present invention.

Finally, independent claims 9 and 17 require the program processing to the second database and the predetermined processing to the first database to be performed in parallel. This feature is also not found in the prior art of record as represented by Maurer. Thus, these claims were rejected under 35 U.S.C. §103(a) as being unpatentable over the combination of Maurer and Yanai et al., U.S. Patent No. 5,742,792 (Yanai). Specifically, Yanai is cited as teaching a method and system for remote data mirroring, wherein in an active migration mode, host processing of a primary volume is concurrent with migration to a secondary volume.

However, such is not coincident with the claimed program processing to the second database as the predetermined processing to the first database. Specifically, the program access to the second database (program processing) is independent of the predetermined processing for the first database, as indicated by the program processing being performed after switching the program access

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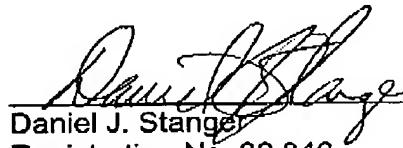
allowance from the first database to the second database. Of course, after performing the predetermined processing and the program processing, in parallel, the first and second databases may have different database contents. On the other hand, Yanai's migration does not occur after switching program access allowance from the first to the second databases. Indeed, Yanai's migration is intended to match the secondary volume with the primary volume.

In view of the foregoing amendments and remarks, the Applicants respectfully submit that the above-identified application is now in condition for allowance. Accordingly, reconsideration and reexamination are respectfully requested.

To the extent necessary, Applicants petition for an extension of time under 37 CFR 1.136. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, or credit any overpayment of fees, to the deposit account of Mattingly, Stanger, Malur & Brundidge, P.C., Deposit Account No. 50-1417 (referencing attorney docket no. 500.43519X00).

Respectfully submitted,

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